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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/767,167	01/30/2004	Akira Miura	042054	4743

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EXAMINER	
REAMES, MATTHEW L	

ART UNIT	PAPER NUMBER
2891	

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06/26/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/767,167	MIURA ET AL.	
	Examiner	Art Unit	
	MATTHEW L. REAMES	2891	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 April 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,2 and 4-11* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2 and 4-11* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claim 1-2,and 4-11 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

a. The recitation of: "...the fine vacuum tube element and the other electronic elements transmitting signals to and from each other;" renders the claim indefinite since it is unclear whether a device or method of use is intended to be claimed. See *IPXL Holdings LLC v. Amazon.com Inc.*, 77 USPQ2d 1140 (Fed. Cir. 2005).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1-2, 5-8, and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mori (5,247,223).

a. As to claim 1-2, and 11 and 11, Mori teaches a fine vacuum tube being used as an interference system (fig. 3) specifically the Aharonov-Bohm effect which uses the quantum effect of ballistic electrons.

Mori does not explicitly teach the use of the device in an integrated circuit.

However integrated circuit with transistors and other solid state elements was well known in the art.

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to have used the device of Mori in an integrated circuit.

One would have been so motivated in order to have formed an integrated circuit with a transistor capable of operating at high speed at room temperature (see e.g. column 5).

b. As to claim 5, integrated optical devices with transistors an optical devices was well known in the art.

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to integrate the device of Mori into a high speed optical network.

One would have been so motivated for the high speed attainable by the device of Mori increasing overall device performance.

c. As to claim 6, magnetic and electric sensing device were well known in the art and further known to have transistors and other electronic devices.

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to integrate the device of Mori magnetic/electric sensor.

One would have been so motivated for the high speed attainable by the device of Mori increasing overall device performance.

d. As to claims 7-8, Mori teaches a thermionic cathode maybe used (see last sentence of column 6).

Mori does not explicitly teach a carbon nanotube.

However these were well known in the art for there use in electron emitting devices.

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to have used a carbon nanotube in conjunction or in place of the tip of Mori.

One would have been so motivated in order to have formed a sharper tip for the device increasing device functionality or to in order to simply manufacture since etching would not be required.

4. Claims 1-2, 4, and 9-10, are rejected under 35 U.S.C. 103(a) as being unpatentable over Okada (5,003,360) in view of Mori.

a. Okada teaches using a semiconductor device using the Aharonov-Bohm effect, measuring the phase difference of a electron as it travels through a slit (see e.g. fig. 1 and fig. 4), can be used to form digital to analog converters by forming a plurality of such devices (see e.g. fig. 1and description, fig. 4 and description and fig. 9 and description). Okada further teaches a semiconductor device. Okada further teaches the device is made from semiconductor material and is not a vacuum tube.

Mori teaches the fine vacuum tube used as an interference device (see e.g. fig. 3). Mori further teaches the transistor of Okada fig. 1 was known (see e.g. fig. 1 of Mori). Further Mori teaches the devices of Okada using a semiconductor material must be cooled to low temperature in order to operate (see e.g. background).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to have formed the A/D converter of Okada fig. 9 from the fine vacuum tubes devices of Mori.

One would have been so motivated in order to operate the device at room temperatures.

b. As to claims 9-10, it is unclear what a Mach-Zehnder interfermoter for an electron is since the term is used for optical systems.

However Okada teaches the interferometer as claimed/suggested (see e.g. figs. 9). Therefore the Okada/Mori device will be understood to be a Mach Zehnder interferometer.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MATTHEW L. REAMES whose telephone number is (571)272-2408. The examiner can normally be reached on M-Th 6:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, B. William Baumeister can be reached on (571)272-1722. The fax phone

number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/MLR/

/BRADLEY W BAUMEISTER/

Supervisory Patent Examiner, Art Unit 2891